



flush away any reactant residues from a prior reaction that might contaminate any of the desired chemical products subsequently produced.

22. The method of Claim 20, further comprising the steps of:

- (a) providing a second automatically controlled reactant supply;
- (b) injecting at least one additional reactant from said second automatically controlled reactant supply into said chemical reactor when injecting any reactant selected from the first automatically controlled reactant supply;
- (c) repeating the previous two steps for each of said subsequently selected reactants injected from said first automatically controlled reactant supply, said at least one additional reactant reacting with the reactant selected from the first automatically controlled reactant supply to form the desired chemical products.

23. The method of Claim 20, further comprising the step of automatically controlling said chemical processing system in accord with a software program, to automatically generate said substance library.

24. A method for producing a substance library of chemical compounds comprising a plurality of different desired chemical products, said method comprising the steps of:

- (a) providing:
 - (i) a chemical processing system that includes a plurality of reactant supplies, each containing a plurality of reagents, said plurality of reactant supplies being controlled in accord with a software program that identifies specific reactants required to produce the plurality of different desired chemical products; and
 - (ii) a chemical reactor that is controlled in accord with the software program to successively produce the plurality of different desired chemical products;
- (b) automatically selecting reactants to be supplied from the plurality of reactant supplies to produce one of the plurality of different desired chemical products;
- (c) automatically injecting any reactant thus selected to produce said one of the plurality of different desired chemical products into said chemical reactor, said chemical reactor being controlled to cause a chemical transformation of any reactant that has

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been selected and injected so as to form said one of the plurality of different desired chemical products;

(d) delivering said one of the plurality of different desired chemical products into a selected collection volume provide therefore;

(e) automatically repeating steps (b)-(d) in accord with the software program until the plurality of different desired chemical products have been delivered into different selected collection volumes, thereby completing said substance library.

25. The method of Claim 24, further comprising the step of flushing said chemical processing system with a solvent before steps b-c are repeated, to ensure that no reactant residues from a prior reaction are present to contaminate a next desired chemical product.

26. The method of Claim 24, further comprising the step of automatically controlling said chemical processing system in accord with a software program, to generate said substance library.

27. A method for producing a desired chemical product using a series of sequential reactions, said method comprising the steps of:

(a) providing an automated chemical processing system that includes a plurality of reactants and a plurality of chemical reactors that are automatically controlled to carryout the following processing steps;

(b) automatically selecting and injecting at least one selected reactant into a first chemical reactor, said first chemical reactor being operated so as to cause said at least one selected reactant to undergo a chemical transformation to produce an intermediate desired chemical product;

(c) automatically sequentially injecting the intermediate product from the first chemical reactor into a successive chemical reactor from among the plurality of chemical reactors, with at least one other selected reactant, causing a further chemical transformation that produces a further chemical product, which may be said desired chemical product; and

(d) if required, repeating step (c) with successive chemical reactors from among the plurality of chemical reactors and other selected reactants, until said desired chemical product is produced as a result of the chemical reaction, any such repetitive steps being automatically controlled.